

Abstract of the Disclosure

VARIABLE CONTROL ORIFICE MEMBER AND FUEL INJECTOR USING
SAME

Engineers have determined that the ability to front end rate shape injection events can result in a number of advantages, including improved injector performance and a reduction in undesirable emissions. In addition, engineers have learned that it is desirable for the needle valve to open slowly at the beginning of an injection event and to close abruptly to end the injection event. Therefore, the present invention utilizes at least one orifice member that is movably positioned in an injector body such that fluid flowing away from the needle valve member closing hydraulic surface flows through a relatively restricted flow path and fluid flowing toward the needle valve member flow through a relatively unrestricted flow path.